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PHY201

College Physics I

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Program Head: Yangsoo Kim

Dean's Review:

Dean's Signature: _____ Date Reviewed: ___/___/___

VIRGINIA WESTERN COMMUNITY COLLEGE
PO Box 14007
Roanoke, VA 24038
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Revised: Fall 2016

PHY201 College Physics I

COURSE OUTLINE

Prerequisites:

MTH 163 or MTH115

Course Description:

Teaches fundamental principles of physics. Covers mechanics, thermodynamics, wave phenomena, electricity and magnetism, and selected topics in modern physics.

Prerequisite: MTH 163 or MTH115

Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week. 4 credits

Semester Credits: 4

Lecture Hours: 3

Lab/Recitation Hours: 3

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Course Outcomes

At the completion of this course, the student should be able to:

1. Apply the equations of kinematics to predict the position and the velocity at a later time.
2. Apply Newton's laws of motion to find the acceleration of the objects and to identify other forces in the system.
3. Apply the conservation laws (mechanical energy conservation, and momentum conservation) to compare the system before and after the interaction.
4. Find the solutions of problems involving rectilinear motion, parabolic motion, circular motion, & objects in equilibrium.
5. Apply the conservation laws to the solutions of problems involving collisions, conservative & nonconservative forces.
6. Understand the fluid mechanics, such as buoyant force and Bernoulli's equation.
7. Solve problems involving thermal expansion, heat transfer, thermodynamic processes & the behavior of ideal gases.

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Required Materials:

A calculator for exams and laboratory works

Textbook:

College Physics, Knight, Jones and Field, 3rd edition, Pearson (ISBN 9780321879721) with Mastering Physics for homework

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Topical Description

- Chapter 1 Representing Motion
- Chapter 2 Motion in One Dimension
- Chapter 3 Vectors and Motion in Two Dimension
- Chapter 4 Forces and Newton's Laws of Motion
- Chapter 5 Applying Newton's Laws
- Chapter 6 Circular Motion, Orbits, and Gravity
- Chapter 7 Rotational Motion
- Chapter 8 Equilibrium and Elasticity
- Chapter 9 Momentum
- Chapter 10 Energy and Work
- Chapter 11 Using Energy
- Chapter 12 Thermal Properties of Matter
- Chapter 13 Fluids
- Chapter 14 Oscillations

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Lab Schedule

Lab 1	Introduction. Safety and Significant Figures. Fitting curves.
Lab 2	Free Fall
Lab 3	Addition of Force: Vector
Lab 4	Projectile motion
Lab 5	Static and Kinetic friction
Lab 6	Newton's 2nd Law
Lab 7	Circular Motion and Centripetal Force
Lab 8	Ballistic pendulum
Lab 9	Energy conservation
Lab 10	Moment of Inertia
Lab 11	Simple Harmonic Motion
Lab 12	Archimedes' Principle

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